

## PROGRAM SPECIFICATION

**Title of program:** Engineering in Food Technology Program

**Training level:** University Degree

**Degree training:** Food Technology

**Program code:** 7.54.01.01

**Mode of Training:** Regular Full- time

**Training time:** 4 years

**Time for enrollment:** since 2023

**Build time/ update curriculum program:** since 4/2023

### 1. GENERAL INFORMATION OF THE PROGRAM

#### 1.1. Program educational objectives (PEOs)

After 3-5 years of graduation, graduates can:

PEO1: Researching, developing, and working professionally in the field of food technology.

PEO2: Undertaking production processes, quality control processes, and food quality assessment in factories and industrial production systems.

PEO3: Learning and studying lifelong

#### 1.2. Job titles of graduates

- Entrepreneur;
- Production engineer; Production supervisor;
- Supervise the supply chain and food production;
- Food R&D researchers (R&D); Quality assessment staff (QA); Quality control staff (QC);
- Food hygiene and safety inspection expert at testing facilities, nutrition centers, and medical centers;
- Consulting on nutrition and food safety at businesses, nutrition centers, and hospitals;
- Postgraduate, lecturer at universities training and researching food technology in Vietnam and abroad.

#### 1.3. Length of program and mode of study

- Mode of Training: Regular Full- time
- Training time: 4 years

### 2. ADMISSION CRITERIA

According to the current regular university admission regulations of LHU and the Ministry of Education and Training.

### 3. PROGRAM LEARNING OUTCOMES (PLOs)

Upon completion of the programme, graduates able to:

| <b>Program learning outcomes (PLOs/SOs)</b> | <b>Level (Bloom domain/ Bloom level)</b> | <b>Content</b>   |
|---|--|--|
| <b>Knowledge</b>                            |  |  |
| PLO1  | Knowledge (3)                            | Apply knowledge of mathematics, natural sciences, social sciences, and food science to solve problems in the field of food technology. |
| PLO2  | Knowledge (4)                            | Analysis to solve problems in the field of food technology   |
| PLO3  | Knowledge (5)                            | Proposed food technology process.  |
| PLO4  | Knowledge (2)                            | Explain the impact of food technology solutions on the environment and society.  |
| <b>Skills</b>                               |  |  |
| PLO5  | Skill (2)                                | Carry out steps in the food analysis process and food product manufacturing process  |
| PLO6  | Skill (3)                                | Use effective communication skills in language, text, and images in the field of food technology.                                      |
| PLO 7                                       | Skill (4)                                | Collaborate and work effectively in groups.  |
| <b>Attitude</b>                             |  |  |
| PLO 8                                       | Attitude (2)                             | Comply with professional conduct and ethics.   |
| PLO 9                                       | Attitude (2)                             | Pursue lifelong learning and research.   |

#### 4. MAPPING OF COURSES AND RELATIONSHIPS WITH PROGRAM LEARNING OUTCOMES

| No. | Course Code | Course Name                      | PLOs              |      |      |             |             |                   |             |             |      |             |
|-----|-------------|----------------------------------|-------------------|------|------|-------------|-------------|-------------------|-------------|-------------|------|-------------|
|     |             |                                  | PLO1              | PLO2 | PLO3 | PLO4        | PLO5        | PLO6              | PLO7        | PLO8        | PLO9 |             |
| 1   | 102008      | General Physics                  | <b>CLO1, CLO2</b> | -    | -    | -           | -           | -                 | -           | -           | -    | -           |
| 2   | 102025      | Advanced mathematics 1           | <b>CLO1</b>       | -    | -    | -           | -           | -                 | -           | -           | -    | <b>CLO2</b> |
| 3   | 102055      | English 1                        | -                 | -    | -    | -           | -           | <b>CLO1, CLO2</b> | -           | -           | -    | -           |
| 4   | 120054      | General Chemistry                | <b>CLO2</b>       | -    | -    | -           | -           | -                 | -           | -           | -    | -           |
| 5   | 120079      | Field trip                       | -                 | -    | -    | <b>CLO1</b> | -           | <b>CLO2</b>       | -           | <b>CLO3</b> | -    | -           |
| 6   | 117043      | Basic marketing                  | <b>CLO1</b>       | -    | -    | -           | -           | <b>CLO2</b>       | <b>CLO3</b> | -           | -    | -           |
| 7   | 117010      | Labs Technology Skills           | <b>CLO1</b>       | -    | -    | -           | <b>CLO2</b> | -                 | -           | -           | -    | -           |
| 8   | 117001      | Experiments In General Chemistry | <b>CLO1</b>       | -    | -    | -           | <b>CLO2</b> | -                 | -           | -           | -    | -           |
| 9   | 102011      | Experiments in general physics   | <b>CLO1, CLO2</b> | -    | -    | -           | <b>CLO3</b> | -                 | -           | -           | -    | -           |
| 10  | 102014      | Office Information               | <b>CLO1</b>       | -    | -    | -           | -           | -                 | -           | -           | -    | <b>CLO2</b> |
| 11  | 102062      | Advanced mathematics 2           | <b>CLO1</b>       | -    | -    | -           | -           | -                 | -           | -           | -    | <b>CLO2</b> |
| 12  | 102034      | Probability Statistics           | <b>CLO1</b>       | -    | -    | -           | -           | -                 | -           | -           | -    | <b>CLO2</b> |
| 13  | 102056      | English 2                        | -                 | -    | -    | -           | -           | <b>CLO1, CLO2</b> | -           | -           | -    | -           |
| 14  | 117007      | Inorganic Chemistry              | <b>CLO3</b>       | -    | -    | -           | -           | <b>CLO4</b>       | -           | -           | -    | -           |

|    |        |   |                      |             |   |   |             |                       |             |             |             |
|----|--------|---|----------------------|-------------|---|---|-------------|-----------------------|-------------|-------------|-------------|
| 15 | 117002 | Organic Chemistry                               | <b>CLO1<br/>CLO2</b> | -           | - | - | -           | -                     | -           | <b>CLO3</b> | -           |
| 16 | 117057 | Experiments in Inorganic chemistry              | <b>CLO1</b>          | -           | - | - | -           | -                     | <b>CLO2</b> | -           | -           |
| 17 | 117055 | Experiments in Organic chemistry                | <b>CLO1</b>          | -           | - | - | <b>CLO2</b> | <b>CLO3</b>           |             | <b>CLO4</b> | -           |
| 18 | 102057 | English 3                                       | -                    | -           | - | - | -           | <b>CLO1,<br/>CLO2</b> | -           | -           | -           |
| 19 | 120055 | Microbiology and microbiological testing method | <b>CLO1</b>          | <b>CLO2</b> | - | - | -           | -                     | -           | -           | <b>CLO3</b> |
| 20 | 120056 | Methods of Food analysis technology             | <b>CLO1</b>          | <b>CLO2</b> | - | - | -           | <b>CLO2</b>           | -           | <b>CLO4</b> | -           |
| 21 | 120057 | Process and Technology Equipment I              | <b>CLO2</b>          | -           | - | - | -           | <b>CLO3</b>           | -           | -           | -           |
| 22 | 120058 | Physical Chemistry                              | <b>CLO3</b>          | -           | - | - | -           | -                     | -           | -           | -           |
| 23 | 120024 | Biochemistry                                    | <b>CLO1</b>          | <b>CLO2</b> | - | - | -           | -                     | -           | -           | <b>CLO3</b> |
| 24 | 117045 | Scientific research methodology                 | <b>CLO1</b>          | -           | - | - | -           | <b>CLO2</b>           | -           | -           | <b>CLO3</b> |
| 25 | 117056 | Experiment of Physical Chemistry                | <b>CLO1</b>          | -           | - | - | <b>CLO2</b> | <b>CLO3</b>           |             | <b>CLO4</b> | -           |
| 26 | 120003 | Biochemistry practice                           | -                    | <b>CLO1</b> | - | - | <b>CLO2</b> | -                     | <b>CLO3</b> | -           | -           |
| 27 | 102063 | Marxist-Leninist philosophy                     | <b>CLO1</b>          | -           | - | - | -           | -                     | -           | -           | <b>CLO2</b> |

|    |        |   |             |             |             |             |             |                   |             |             |             |
|----|--------|---|-------------|-------------|-------------|-------------|-------------|-------------------|-------------|-------------|-------------|
| 28 | 102064 | Marxist-Leninist political economy        | <b>CLO1</b> | -           | -           | -           | -           | -                 | -           | -           | <b>CLO2</b> |
| 29 | 102065 | Scientific socialism                      | <b>CLO1</b> | -           | -           | -           | -           | -                 | -           | -           | <b>CLO2</b> |
| 30 | 102006 | General Law                               | <b>CLO1</b> | -           | -           | -           | -           | -                 | -           | <b>CLO2</b> | <b>CLO3</b> |
| 31 | 102058 | English 4                                 | -           | -           | -           | -           | -           | <b>CLO1, CLO2</b> | -           | -           | -           |
| 32 | 120059 | Process and Technology Equipment II       | <b>CLO2</b> | -           | -           | -           | -           | <b>CLO3</b>       | -           | -           | -           |
| 33 | 120060 | Food processing technology                | -           | -           | <b>CLO1</b> | <b>CLO2</b> | -           | -                 | -           | -           | <b>CLO3</b> |
| 34 | 120004 | Practical Of Microbiology                 | -           | <b>CLO1</b> | -           | -           | <b>CLO2</b> | -                 | <b>CLO3</b> | -           | -           |
| 35 | 120061 | Experiment of Food Analysis Technology    | -           | <b>CLO1</b> | -           | -           | <b>CLO2</b> | -                 | <b>CLO3</b> | -           | -           |
| 36 | 120078 | Descriptive Geometry                      | -           | -           | <b>CLO2</b> | -           | -           | <b>CLO3</b>       | -           | -           | <b>CLO1</b> |
| 37 | 122016 | Labor safety                              | -           | -           | -           | <b>CLO1</b> | -           | -                 | <b>CLO2</b> | <b>CLO3</b> | <b>CLO4</b> |
| 38 | 117069 | Cleaner production technology             | -           | <b>CLO1</b> | -           | <b>CLO2</b> | -           | -                 | -           | <b>CLO3</b> | -           |
| 39 | 102059 | English 5                                 | -           | -           | -           | -           | -           | <b>CLO1, CLO2</b> | -           | -           | -           |
| 40 | 120062 | Chemical Equipment Design and Calculation | <b>CLO1</b> | <b>CLO2</b> | -           | -           | -           | <b>CLO3</b>       | -           | -           | -           |
| 41 | 117029 | English academic writing                  | -           | -           | -           | -           | -           | <b>CLO1</b>       | -           | -           | <b>CLO2</b> |

|    |        |   |             |             |             |             |             |                   |             |             |             |
|----|--------|---|-------------|-------------|-------------|-------------|-------------|-------------------|-------------|-------------|-------------|
| 42 | 117068 | Quality Management                            | -           | <b>CLO1</b> | -           | <b>CLO2</b> | -           | -                 | -           | -           | -           |
| 43 | 120013 | Fermentation technology                       | -           | <b>CLO1</b> | <b>CLO2</b> | -           | -           | -                 | <b>CLO3</b> | -           | -           |
| 44 | 120080 | 1st company internship                        | -           | -           | -           | -           | -           | <b>CLO1</b>       | -           | <b>CLO2</b> | -           |
| 45 | 120063 | Experimental Design and Data Analysis         | <b>CLO1</b> | <b>CLO2</b> | -           | -           | -           | <b>CLO3</b>       | -           | -           | -           |
| 46 | 120053 | Experiment of fermentation technology         | -           | <b>CLO1</b> | <b>CLO2</b> | -           | <b>CLO3</b> | -                 | <b>CLO4</b> | -           | -           |
| 47 | 120064 | 1st Specific Project                          | -           | -           | <b>CLO1</b> | -           | <b>CLO2</b> | -                 | <b>CLO3</b> | -           | -           |
| 48 | 120029 | Functional Food                               | <b>CLO1</b> | -           | -           | <b>CLO2</b> | -           | -                 | -           | <b>CLO3</b> | -           |
| 49 | 122017 | Human and Environment                         | <b>CLO1</b> | -           | -           | -           | -           | -                 | -           | <b>CLO2</b> | -           |
| 50 | 122060 | Water - waste water treatment engineering     | -           | -           | -           | <b>CLO1</b> | -           | -                 | -           | <b>CLO2</b> | -           |
| 51 | 102066 | The History of the Vietnamese Communist Party | <b>CLO1</b> | -           | -           | -           | -           | -                 | -           | <b>CLO2</b> | -           |
| 52 | 102033 | Ho Chi Minh's ideology                        | <b>CLO1</b> | -           | -           | -           | -           | -                 | -           | <b>CLO2</b> | -           |
| 53 | 102060 | English 6                                     | -           | -           | -           | -           | -           | <b>CLO1, CLO2</b> | -           | -           | -           |
| 54 | 117030 | English technical presentation                | -           | -           | -           | -           | -           | <b>CLO1</b>       | -           | -           | <b>CLO2</b> |
| 55 | 120081 | 2nd company internship                        | -           | -           | -           | -           | -           | <b>CLO1</b>       | -           | <b>CLO2</b> | -           |
| 56 | 120018 | Post-harvest technology                       | -           | <b>CLO1</b> | <b>CLO2</b> | <b>CLO3</b> | -           | -                 | -           | -           | -           |

|    |        |  |             |             |             |             |             |             |             |             |             |
|----|--------|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 57 | 120020 | Sensory Evaluation and Food Quality Management                     | -           | <b>CLO1</b> | -           | -           | -           | <b>CLO2</b> | -           | -           | -           |
| 58 | 120065 | 2nd Specific Project   | -           | -           | <b>CLO1</b> | -           | <b>CLO2</b> | <b>CLO3</b> | <b>CLO4</b> | -           | -           |
| 59 | 120048 | Practical Sensory Evaluation                                       | -           | <b>CLO1</b> | -           | -           | <b>CLO2</b> | -           | <b>CLO3</b> | -           | -           |
| 60 | 121044 | Natural products technology  | -           | <b>CLO1</b> | -           | <b>CLO2</b> | -           | <b>CLO3</b> | -           | <b>CLO4</b> | -           |
| 61 | 120066 | Product development  | -           | -           | <b>CLO1</b> | -           | <b>CLO2</b> | -           | -           | -           | <b>CLO3</b> |
| 62 | 120026 | Food packaging technology  | -           | -           | -           | <b>CLO1</b> | -           | <b>CLO2</b> | -           | -           | -           |
| 63 | 120067 | Business Administration for engineers                              | <b>CLO1</b> | <b>CLO3</b> | -           | -           | -           | -           | <b>CLO2</b> | <b>CLO4</b> | -           |
| 64 | 120069 | Meat and seafood processing and preservation                       | -           | <b>CLO1</b> | <b>CLO2</b> | <b>CLO3</b> | -           | -           | -           | -           | -           |
| 65 | 120070 | Dairy and Bakery Processing Technology                             | -           | <b>CLO1</b> | <b>CLO2</b> | <b>CLO3</b> | -           | -           | <b>CLO4</b> | -           | -           |
| 66 | 120071 | Practical Tea, Coffee, Vegetables and Fruits Processing Technology | -           | <b>CLO1</b> | <b>CLO2</b> | <b>CLO3</b> | -           | <b>CLO4</b> | -           | -           | -           |
| 67 | 120072 | Technology of soft drinks and fruit juices                         | -           | <b>CLO1</b> | <b>CLO2</b> | <b>CLO3</b> | -           | <b>CLO4</b> | -           | -           | -           |
| 68 | 120073 | Food Additives   | -           | -           | -           | <b>CLO1</b> | -           | -           | -           | -           | -           |

|    |        |  |             |   |             |             |             |             |             |             |             |
|----|--------|--|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 69 | 120074 | Food Safety Laws   | -           | - | -           | <b>CLO1</b> | -           | -           | -           | <b>CLO2</b> | -           |
| 70 | 120076 | Nutrition and Food Safety  | <b>CLO1</b> | - | -           | -           | -           | -           | -           | <b>CLO2</b> | -           |
| 71 | 120046 | Practical Meat and seafood processing and preservation             | -           | - | <b>CLO1</b> | -           | <b>CLO2</b> | <b>CLO3</b> | <b>CLO4</b> | -           | -           |
| 72 | 120047 | Practical Dairy and Bakery Processing Technology                   | -           | - | -           | -           | <b>CLO1</b> | -           | <b>CLO2</b> | -           | -           |
| 73 | 120049 | Practical Tea, Coffee, Vegetables and Fruits Processing Technology | -           | - | -           | -           | <b>CLO1</b> | <b>CLO2</b> | -           | -           | -           |
| 74 | 120077 | Experiment of soft drinks and fruit juices processing              | -           | - | <b>CLO1</b> | -           | <b>CLO2</b> | <b>CLO3</b> | <b>CLO4</b> | -           | -           |
| 75 | 66666  | Thesis   | -           | - | <b>CLO1</b> | -           | -           | <b>CLO2</b> | -           | -           | <b>CLO3</b> |

#### 5. MAPPING OF TEACHING AND LEARNING METHODS WITH PROGRAM LEARNING OUTCOMES (PLOs)

| No. | Course Code | Course Name            | PLOs         |      |      |      |      |                   |      |      |           |
|-----|-------------|------------------------|--------------|------|------|------|------|-------------------|------|------|-----------|
|     |             |                        | PLO1         | PLO2 | PLO3 | PLO4 | PLO5 | PLO6              | PLO7 | PLO8 | PLO9      |
| 1   | 102008      | General physics        | <b>1</b>     | -    | -    | -    | -    | -                 | -    | -    | -         |
| 2   | 102025      | Advanced mathematics 1 | <b>2, 12</b> | -    | -    | -    | -    | -                 | -    | -    | <b>16</b> |
| 3   | 102055      | English 1              | -            | -    | -    | -    | -    | <b>1, 5, 7, 8</b> | -    | -    | -         |



|    |        |                                    |                    |   |   |              |          |                   |              |             |             |
|----|--------|------------------------------------|--------------------|---|---|--------------|----------|-------------------|--------------|-------------|-------------|
| 4  | 120054 | General Chemistry                  | <b>1, 2, 8</b>     | - | - | -            | -        | -                 | -            | -           | -           |
| 5  | 120079 | Field trip                         | -                  | - | - | <b>2, 10</b> | -        | <b>14</b>         | -            | <b>10</b>   | -           |
| 6  | 117043 | Basic marketing                    | <b>1, 3, 8, 11</b> | - | - | -            | -        | <b>3, 11</b>      | <b>3, 11</b> | -           | -           |
| 7  | 117010 | Labs Technology Skills             | <b>1</b>           | - | - | -            | <b>5</b> | -                 | -            | -           | -           |
| 8  | 117001 | Experiments In General Chemistry   | <b>1</b>           | - | - | -            | <b>5</b> | -                 | -            | -           | -           |
| 9  | 102011 | Experiments in general physics     | <b>1</b>           | - | - | -            | <b>5</b> | -                 | -            | -           | -           |
| 10 | 102014 | Office Information                 | <b>1, 5</b>        | - | - | -            | -        | -                 | -            | -           | <b>1, 5</b> |
| 11 | 102062 | Advanced mathematics 2             | <b>2, 12</b>       | - | - | -            | -        | -                 | -            | -           | <b>16</b>   |
| 12 | 102034 | Probability Statistics             | <b>2, 12</b>       | - | - | -            | -        | -                 | -            | -           | <b>16</b>   |
| 13 | 102056 | English 2                          | -                  | - | - | -            | -        | <b>1, 5, 7, 8</b> | -            | -           | -           |
| 14 | 117007 | Inorganic Chemistry                | <b>1, 3, 8, 12</b> | - | - | -            | -        | <b>2, 10</b>      | -            | -           | -           |
| 15 | 117002 | Organic Chemistry                  | <b>1, 3, 12</b>    | - | - | -            | -        | -                 | -            | <b>3,12</b> | -           |
| 16 | 117057 | Experiments in Inorganic chemistry | <b>5</b>           | - | - | -            | -        | -                 | <b>3, 5</b>  | -           | -           |
| 17 | 117055 | Experiments in Organic chemistry   | <b>1</b>           | - | - | -            | <b>5</b> | <b>10</b>         | -            | <b>5,10</b> | -           |
| 18 | 102057 | English 3                          | -                  | - | - | -            | -        | <b>1, 5, 7, 8</b> | -            | -           | -           |

|    |        |   |                    |                 |   |   |          |                   |          |                 |                 |
|----|--------|---|--------------------|-----------------|---|---|----------|-------------------|----------|-----------------|-----------------|
| 19 | 120055 | Microbiology and microbiological testing method | <b>1, 3, 15</b>    | <b>1,3</b>      | - | - | -        | -                 | -        | -               | <b>3, 15</b>    |
| 20 | 120056 | Methods of Food analysis technology             | <b>1</b>           | <b>3</b>        | - | - | -        | <b>15</b>         | -        | -               | -               |
| 21 | 120057 | Process and Technology Equipment I              | <b>1, 2, 10</b>    | -               | - | - | -        | <b>2, 10</b>      | -        | -               | -               |
| 22 | 120058 | Physical Chemistry                              | <b>1, 2, 8</b>     | -               | - | - | -        | -                 | -        | -               | -               |
| 23 | 120024 | Biochemistry                                    | <b>1, 3</b>        | <b>1, 2, 10</b> | - | - | -        | -                 | -        | -               | <b>12</b>       |
| 24 | 117045 | Scientific research methodology                 | <b>1,11</b>        | -               | - | - | -        | <b>1,11</b>       | -        | -               | <b>1</b>        |
| 25 | 117056 | Experiment of Physical Chemistry                | <b>1</b>           | -               | - | - | <b>5</b> | <b>10</b>         | -        | <b>5,10</b>     | -               |
| 26 | 120003 | Biochemistry practice                           | -                  | <b>2</b>        | - | - | <b>5</b> | -                 | <b>3</b> | -               | -               |
| 27 | 102063 | Marxist-Leninist philosophy                     | <b>1, 2, 8, 12</b> | -               | - | - | -        | -                 | -        | -               | <b>2, 12</b>    |
| 28 | 102064 | Marxist-Leninist political economy              | <b>1, 2, 8, 12</b> | -               | - | - | -        | -                 | -        | -               | <b>2, 12</b>    |
| 29 | 102065 | Scientific socialism                            | <b>1, 2, 8, 12</b> | -               | - | - | -        | -                 | -        | -               | <b>2, 12</b>    |
| 30 | 102006 | General Laws                                    | <b>1, 8, 11</b>    | -               | - | - | -        | -                 | -        | <b>1, 8, 11</b> | <b>1, 8, 11</b> |
| 31 | 102058 | English 4                                       | -                  | -               | - | - | -        | <b>1, 5, 7, 8</b> | -        | -               | -               |
| 32 | 120059 | Process and Technology                          | <b>1, 2, 10</b>    | -               | - | - | -        | <b>2, 10</b>      | -        | -               | -               |

|    |        |   |              |                |           |                  |             |                   |                 |                  |           |
|----|--------|---|--------------|----------------|-----------|------------------|-------------|-------------------|-----------------|------------------|-----------|
|    |        | Equipment II                              |              |                |           |                  |             |                   |                 |                  |           |
| 33 | 120060 | Food processing technology                | -            | -              | <b>15</b> | <b>10</b>        | -           | -                 | -               | -                | <b>12</b> |
| 34 | 120004 | Practical Of Microbiology                 | -            | <b>5</b>       | -         | -                | <b>5, 6</b> | -                 | <b>5</b>        | -                | -         |
| 35 | 120061 | Experiment of Food Analysis Technology    | -            | <b>2</b>       | -         | -                | <b>5</b>    | -                 | <b>3</b>        | -                | -         |
| 36 | 120078 | Descriptive Geometry                      | -            | -              | <b>3</b>  | -                | -           | <b>1</b>          | -               | -                | <b>1</b>  |
| 37 | 122016 | Labor safety                              | -            | -              | -         | <b>3, 10, 11</b> | -           | -                 | <b>3, 10</b>    | <b>3, 10, 11</b> | <b>3</b>  |
| 38 | 117069 | Cleaner production technology             | -            | <b>3, 10</b>   | -         | <b>3</b>         | -           | -                 | -               | <b>3</b>         | -         |
| 39 | 102059 | English 5                                 | -            | -              | -         | -                | -           | <b>1, 5, 7, 8</b> | -               | -                | -         |
| 40 | 120062 | Chemical Equipment Design and Calculation | <b>1, 2</b>  | <b>3</b>       | -         | -                | -           | <b>3, 10</b>      | -               | -                | -         |
| 41 | 117029 | English academic writing                  | -            | -              | -         | -                | -           | <b>1,11</b>       | -               | -                | <b>1</b>  |
| 42 | 117068 | Quality Management                        | -            | <b>1,11</b>    | -         | <b>1,11</b>      | -           | -                 | -               | -                | -         |
| 43 | 120013 | Fermentation technology                   | -            | <b>1, 2, 3</b> | <b>15</b> | -                | -           | -                 | <b>2, 3, 15</b> | -                | -         |
| 44 | 120080 | 1st company internship                    | -            | -              | -         | -                | -           | <b>10</b>         | -               | <b>2, 4</b>      | -         |
| 45 | 120063 | Experimental Design and Data Analysis     | <b>7, 12</b> | <b>7, 12</b>   | -         | -                | -           | <b>7, 9</b>       | -               | -                | -         |
| 46 | 120053 | Experiment of fermentation technology     | -            | <b>5</b>       | <b>5</b>  | -                | <b>5</b>    | -                 | <b>3, 5</b>     | -                | -         |

|    |        |  |                    |               |                  |             |             |                   |             |              |                   |
|----|--------|--|--------------------|---------------|------------------|-------------|-------------|-------------------|-------------|--------------|-------------------|
| 47 | 120064 | 1st Specific Project                           | -                  | -             | <b>18</b>        | -           | <b>18</b>   | -                 | <b>18</b>   | -            | -                 |
| 48 | 120029 | Functional Food                                | <b>1</b>           | -             | -                | <b>2</b>    | -           | -                 | -           | <b>15</b>    | -                 |
| 49 | 122017 | Human and Environment                          | <b>1</b>           | -             | -                | -           | -           | -                 | -           | <b>1</b>     | -                 |
| 50 | 122060 | Water - waste water treatment engineering      | -                  | -             | -                | <b>3</b>    | -           | -                 | -           | <b>3, 10</b> | -                 |
| 51 | 102066 | The History of the Vietnamese Communist Party  | <b>1, 2, 8, 12</b> | -             | -                | -           | -           | -                 | -           | <b>2, 12</b> | -                 |
| 52 | 102033 | Ho Chi Minh's ideology                         | <b>1, 2, 8, 12</b> | -             | -                | -           | -           | -                 | -           | <b>2, 12</b> | -                 |
| 53 | 102060 | English 6                                      | -                  | -             | -                | -           | -           | <b>1, 5, 7, 8</b> | -           | -            | <b>1, 5, 7, 8</b> |
| 54 | 117030 | English technical presentation                 | -                  | -             | -                | -           | -           | <b>1,11</b>       | -           | -            | <b>1</b>          |
| 55 | 120081 | 2nd company internship                         | -                  | -             | -                | -           | -           | <b>10</b>         | -           | <b>2, 4</b>  | -                 |
| 56 | 120018 | Post-harvest technology                        | -                  | <b>1, 3</b>   | <b>3, 13, 15</b> | <b>1, 3</b> | -           | -                 | -           | -            | -                 |
| 57 | 120020 | Sensory Evaluation and Food Quality Management | -                  | <b>12, 17</b> | -                | -           | -           | <b>9, 17</b>      | -           | -            | -                 |
| 58 | 120065 | 2nd Specific Project                           | -                  | -             | <b>15</b>        | -           | <b>5</b>    | <b>10</b>         | <b>3</b>    | -            | -                 |
| 59 | 120048 | Practical Sensory Evaluation                   | -                  | <b>12</b>     | -                | -           | <b>5, 9</b> | -                 | <b>5, 9</b> | -            | -                 |
| 60 | 121044 | Natural products technology                    | -                  | <b>1,3,15</b> | -                | <b>1,3</b>  | -           | <b>15</b>         | -           | <b>3,15</b>  | -                 |

|    |        |  |                    |             |                  |               |              |               |              |              |                 |
|----|--------|--|--------------------|-------------|------------------|---------------|--------------|---------------|--------------|--------------|-----------------|
| 61 | 120066 | Product development  | -                  | -           | <b>1, 18</b>     | -             | <b>1, 18</b> | -             | -            | -            | <b>1, 9, 18</b> |
| 62 | 120026 | Food packaging technology  | -                  | -           | -                | <b>12, 17</b> | -            | <b>12, 17</b> | -            | -            | -               |
| 63 | 120067 | Business Administration for engineers                              | <b>1, 3, 8, 11</b> | <b>11</b>   | -                | -             | -            | -             | <b>3, 11</b> | <b>3, 11</b> | -               |
| 64 | 120069 | Meat and seafood processing and preservation                       | -                  | <b>1, 3</b> | <b>3, 13, 15</b> | <b>1, 3</b>   | -            | -             | -            | -            | -               |
| 65 | 120070 | Dairy and Bakery Processing Technology                             | -                  | <b>12</b>   | <b>12, 17</b>    | <b>12</b>     | -            | -             | <b>9</b>     | -            | -               |
| 66 | 120071 | Practical Tea, Coffee, Vegetables and Fruits Processing Technology | -                  | <b>12</b>   | <b>15</b>        | <b>10</b>     | -            | <b>15</b>     | -            | -            | -               |
| 67 | 120072 | Technology of soft drinks and fruit juices                         | -                  | <b>1, 3</b> | <b>3, 13, 15</b> | <b>1, 3</b>   | -            | <b>3</b>      | -            | -            | -               |
| 68 | 120073 | Food Additives   | -                  | -           | -                | <b>1, 15</b>  | -            | -             | -            | -            | -               |
| 69 | 120074 | Food Safety Laws   | -                  | -           | -                | <b>1, 3</b>   | -            | -             | -            | <b>15</b>    | -               |
| 70 | 120076 | Nutrition and Food Safety  | <b>1</b>           | -           | -                | -             | -            | -             | -            | <b>15</b>    | -               |
| 71 | 120046 | Practical Meat and seafood processing and preservation             | -                  | -           | <b>13</b>        | -             | <b>5, 9</b>  | <b>5, 9</b>   | <b>5, 9</b>  | -            | -               |
| 72 | 120047 | Practical Dairy and Bakery Processing                              | -                  | -           | -                | -             | <b>5, 9</b>  | -             | <b>5, 9</b>  | -            | -               |

|    |        |  |   |   |       |   |   |       |   |   |       |
|----|--------|--|---|---|-------|---|---|-------|---|---|-------|
|    |        | Technology   |   |   |       |   |   |       |   |   |       |
| 73 | 120049 | Practical Tea, Coffee, Vegetables and Fruits Processing Technology | - | - | -     | - | 5 | 10    | - | - | -     |
| 74 | 120077 | Experiment of soft drinks and fruit juices processing              | - | - | 18    | - | 5 | 3     | 3 | - | -     |
| 75 | 66666  | Thesis   | - | - | 4, 18 | - | - | 4, 18 | - | - | 4, 18 |

❖ **Teaching and Learning Methods**

| No. | Teaching and Learning Methods |
|-----|-------------------------------|
| 1   | Lecture                       |
| 2   | Problem solving               |
| 3   | Group discussion              |
| 4   | Internship                    |
| 5   | Practice                      |
| 6   | Hands-on practice             |
| 7   | Computer-Aided Instruction    |
| 8   | Game                          |
| 9   | Peer Learning                 |

| No. | Teaching and Learning Methods     |
|-----|-----------------------------------|
| 10  | Report                            |
| 11  | Case study                        |
| 12  | Flipped Classroom                 |
| 13  | Critical thinking/design thinking |
| 14  | Field Trip                        |
| 15  | Seminar                           |
| 16  | Think pair share                  |
| 17  | Group base learning               |
| 18  | Project base learning             |

**6. MAPPING OF ASSESSMENT METHODS WITH PROGRAM LEARNING OUTCOMES (PLOs)**

| No. | Course Code | Course Name                      | PLOs      |      |      |      |        |              |       |      |       |
|-----|-------------|----------------------------------|-----------|------|------|------|--------|--------------|-------|------|-------|
|     |             |                                  | PLO1      | PLO2 | PLO3 | PLO4 | PLO5   | PLO6         | PLO7  | PLO8 | PLO9  |
| 1   | 102008      | General physics                  | 16        | -    | -    | -    | -      | -            | -     | -    | -     |
| 2   | 102025      | Advanced mathematics 1           | 5, 16     | -    | -    | -    | -      | -            | -     | -    | 17    |
| 3   | 102055      | English 1                        | -         | -    | -    | -    | -      | 3, 9, 13, 18 | -     | -    | -     |
| 4   | 120054      | General Chemistry                | 5, 16, 18 | -    | -    | -    | -      | -            | -     | -    | -     |
| 5   | 120079      | Field trip                       | -         | -    | -    | 15   | -      | 15           | -     | 15   | -     |
| 6   | 117043      | Basic marketing                  | 3, 17     | -    | -    | -    | -      | 8, 20        | 8, 17 | -    | -     |
| 7   | 117010      | Labs Technology Skills           | 13        | -    | -    | -    | 11     | -            | -     | -    | -     |
| 8   | 117001      | Experiments In General Chemistry | 13        | -    | -    | -    | 11     | -            | -     | -    | -     |
| 9   | 102011      | Experiments in general physics   | 13        | -    | -    | -    | 13, 15 | -            | -     | -    | -     |
| 10  | 102014      | Office Information               | 9, 18     | -    | -    | -    | -      | -            | -     | -    | 9, 18 |
| 11  | 102062      | Advanced mathematics 2           | 5, 16     | -    | -    | -    | -      | -            | -     | -    | 17    |
| 12  | 102034      | Probability Statistics           | 5, 16     | -    | -    | -    | -      | -            | -     | -    | 17    |
| 13  | 102056      | English 2                        | -         | -    | -    | -    | -      | 3, 9, 13, 18 | -     | -    | -     |
| 14  | 117007      | Inorganic Chemistry              | 1, 5, 18, | -    | -    | -    | -      | 1, 19        | -     | -    | -     |

|    |        |   |                         |                   |   |   |               |                     |                 |                  |          |
|----|--------|---|-------------------------|-------------------|---|---|---------------|---------------------|-----------------|------------------|----------|
|    |        |   | <b>19</b>               |                   |   |   |               |                     |                 |                  |          |
| 15 | 117002 | Organic Chemistry                               | <b>3,5,16,18</b>        | -                 | - | - | -             | -                   | -               | <b>3,5,16,18</b> | -        |
| 16 | 117057 | Experiments in Inorganic chemistry              | <b>5, 6, 11, 13, 19</b> | -                 | - | - | -             | -                   | <b>5, 6, 19</b> | -                | -        |
| 17 | 117055 | Experiments in Organic chemistry                | <b>3</b>                | -                 | - | - | <b>3,6,11</b> | <b>8,11</b>         | -               | <b>3,11</b>      | -        |
| 18 | 102057 | English 3                                       | -                       | -                 | - | - | -             | <b>3, 9, 13, 18</b> | -               | -                | -        |
| 19 | 120055 | Microbiology and microbiological testing method | <b>1, 3</b>             | <b>16, 17, 18</b> | - | - | -             | -                   | -               | -                | <b>1</b> |
| 20 | 120056 | Methods of Food analysis technology             | <b>3,16</b>             | <b>3,16,17, 8</b> | - | - | -             | <b>8</b>            | -               | -                | -        |
| 21 | 120057 | Process and Technology Equipment I              | <b>5, 16, 19</b>        | -                 | - | - | -             | <b>1, 19</b>        | -               | -                | -        |
| 22 | 120058 | Physical Chemistry                              | <b>5, 16, 18</b>        | -                 | - | - | -             | -                   | -               | -                | -        |
| 23 | 120024 | Biochemistry                                    | <b>18</b>               | <b>8</b>          | - | - | -             | -                   | -               | -                | <b>5</b> |
| 24 | 117045 | Scientific research methodology                 | <b>4</b>                | -                 | - | - | -             | <b>4</b>            | -               | -                | <b>3</b> |
| 25 | 117056 | Experiment of Physical Chemistry                | <b>3</b>                | -                 | - | - | <b>3,6,11</b> | <b>8,11</b>         | -               | <b>3,11</b>      | -        |
| 26 | 120003 | Biochemistry practice                           | -                       | <b>13</b>         | - | - | <b>11</b>     | -                   | <b>17</b>       | -                | -        |



|    |        |  |                            |                 |          |                 |                   |                     |                 |                 |              |
|----|--------|--|----------------------------|-----------------|----------|-----------------|-------------------|---------------------|-----------------|-----------------|--------------|
| 27 | 102063 | Marxist-Leninist philosophy            | <b>1, 3, 8, 16, 17, 18</b> | -               | -        | -               | -                 | -                   | -               | -               | <b>8, 17</b> |
| 28 | 102064 | Marxist-Leninist political economy     | <b>1, 3, 8, 16, 17, 18</b> | -               | -        | -               | -                 | -                   | -               | -               | <b>8, 17</b> |
| 29 | 102065 | Scientific socialism                   | <b>1, 3, 8, 16, 17, 18</b> | -               | -        | -               | -                 | -                   | -               | -               | <b>8, 17</b> |
| 30 | 102006 | General Laws                           | <b>3, 18</b>               | -               | -        | -               | -                 | -                   | -               | <b>16, 18</b>   | <b>3, 18</b> |
| 31 | 102058 | English 4                              | -                          | -               | -        | -               | -                 | <b>3, 9, 13, 18</b> | -               | -               | -            |
| 32 | 120059 | Process and Technology Equipment II    | <b>5, 16, 19</b>           | -               | -        | -               | -                 | <b>1, 19</b>        | -               | -               | -            |
| 33 | 120060 | Food processing technology             | -                          | -               | <b>8</b> | <b>8</b>        | -                 | -                   | -               | -               | <b>5</b>     |
| 34 | 120004 | Practical Of Microbiology              | -                          | <b>11, 13</b>   | -        | -               | <b>10, 11, 13</b> | -                   | <b>11</b>       | -               | -            |
| 35 | 120061 | Experiment of Food Analysis Technology | -                          | <b>13</b>       | -        | -               | <b>11</b>         | -                   | <b>17</b>       | -               | -            |
| 36 | 120078 | Descriptive Geometry                   | -                          | -               | <b>3</b> | -               | -                 | <b>1</b>            | -               | -               | <b>1</b>     |
| 37 | 122016 | Labor safety                           | -                          | -               | -        | <b>1, 8, 17</b> | -                 | -                   | <b>1, 8, 17</b> | <b>1, 8, 17</b> | <b>17</b>    |
| 38 | 117069 | Cleaner production technology          | -                          | <b>1, 8, 17</b> | -        | <b>1, 8, 17</b> | -                 | -                   | -               | <b>8, 17</b>    | -            |

|    |        |   |                            |                  |              |              |              |                     |              |                 |          |
|----|--------|---|----------------------------|------------------|--------------|--------------|--------------|---------------------|--------------|-----------------|----------|
| 39 | 102059 | English 5                                     | -                          | -                | -            | -            | -            | <b>3, 9, 13, 18</b> | -            | -               | -        |
| 40 | 120062 | Chemical Equipment Design and Calculation     | <b>16, 5</b>               | <b>5</b>         | -            | -            | -            | <b>1, 5</b>         | -            | -               | -        |
| 41 | 117029 | English academic writing                      | -                          | -                | -            | -            | -            | <b>5, 14</b>        | -            | -               | <b>3</b> |
| 42 | 117068 | Quality Management                            | -                          | <b>16</b>        | -            | <b>16</b>    | -            | -                   | -            | -               | -        |
| 43 | 120013 | Fermentation technology                       | -                          | <b>1, 16, 17</b> | <b>1, 17</b> | -            | -            | -                   | <b>1, 17</b> | -               | -        |
| 44 | 120080 | 1st company internship                        | -                          | -                | -            | -            | -            | <b>15</b>           | -            | <b>15</b>       | -        |
| 45 | 120063 | Experimental Design and Data Analysis         | <b>9, 18</b>               | <b>9, 18</b>     | -            | -            | -            | <b>9</b>            | -            | -               | -        |
| 46 | 120053 | Experiment of fermentation technology         | -                          | <b>13</b>        | <b>11</b>    | -            | <b>6, 11</b> | -                   | <b>11</b>    | -               | -        |
| 47 | 120064 | 1st Specific Project                          | -                          | -                | <b>2</b>     | -            | <b>2</b>     | -                   | <b>2</b>     | -               | -        |
| 48 | 120029 | Functional Food                               | <b>16</b>                  | -                | -            | <b>8</b>     | -            | -                   | -            | <b>8</b>        | -        |
| 49 | 122017 | Human and Environment                         | <b>18</b>                  | -                | -            | -            | -            | -                   | -            | <b>3,6</b>      | -        |
| 50 | 122060 | Water - waste water treatment engineering     | -                          | -                | -            | <b>1, 17</b> | -            | -                   | -            | <b>1, 8, 17</b> | -        |
| 51 | 102066 | The History of the Vietnamese Communist Party | <b>1, 3, 8, 16, 17, 18</b> | -                | -            | -            | -            | -                   | -            | <b>8, 17</b>    | -        |
| 52 | 102033 | Ho Chi Minh's ideology                        | <b>1, 3, 8, 16, 17, 18</b> | -                | -            | -            | -            | -                   | -            | <b>8, 17</b>    | -        |

|    |        |  |              |                     |              |                  |                 |                     |                 |              |              |
|----|--------|--|--------------|---------------------|--------------|------------------|-----------------|---------------------|-----------------|--------------|--------------|
| 53 | 102060 | English 6                                      | -            | -                   | -            | -                | -               | <b>3, 9, 13, 18</b> | -               | -            | -            |
| 54 | 117030 | English technical presentation                 | -            | -                   | -            | -                | -               | <b>5</b>            | -               | -            | <b>3</b>     |
| 55 | 120081 | 2nd company internship                         | -            | -                   | -            | -                | -               | <b>15</b>           | -               | <b>15</b>    | -            |
| 56 | 120018 | Post-harvest technology                        | -            | <b>3, 8</b>         | <b>8, 17</b> | <b>3, 8, 17</b>  | -               | -                   | -               | -            | -            |
| 57 | 120020 | Sensory Evaluation and Food Quality Management | -            | <b>8, 17, 18</b>    | -            | -                | -               | <b>8, 18</b>        | -               | -            | -            |
| 58 | 120065 | 2nd Specific Project                           | -            | -                   | <b>8</b>     | -                | <b>11</b>       | <b>8</b>            | <b>17</b>       | -            | -            |
| 59 | 120048 | Practical Sensory Evaluation                   | -            | <b>6, 8, 11</b>     | -            | -                | <b>6, 8, 11</b> | -                   | <b>6, 8, 11</b> | -            | -            |
| 60 | 121044 | Natural products technology                    | -            | <b>3,5,8,17, 18</b> | -            | <b>3,5,17</b>    | -               | <b>8</b>            | -               | <b>3, 5</b>  | -            |
| 61 | 120066 | Product development                            | -            | -                   | <b>2, 3</b>  | -                | <b>2, 3</b>     | -                   | -               | -            | <b>2, 17</b> |
| 62 | 120026 | Food packaging technology                      | -            | -                   | -            | <b>8, 17, 18</b> | -               | <b>8, 17, 18</b>    | -               | -            | -            |
| 63 | 120067 | Business Administration for engineers          | <b>3, 17</b> | <b>4, 17</b>        | -            | -                | -               | -                   | <b>8, 17</b>    | <b>8, 17</b> | -            |
| 64 | 120069 | Meat and seafood processing and preservation   | -            | <b>3, 8</b>         | <b>8, 17</b> | <b>3, 8, 17</b>  | -               | -                   | -               | -            | -            |
| 65 | 120070 | Dairy and Bakery Processing Technology         | -            | <b>8, 17, 18</b>    | <b>8</b>     | <b>8, 17, 18</b> | -               | -                   | <b>8</b>        | -            | -            |

|    |        |  |           |             |              |                     |                 |                 |                 |              |          |
|----|--------|--|-----------|-------------|--------------|---------------------|-----------------|-----------------|-----------------|--------------|----------|
| 66 | 120071 | Practical Tea, Coffee, Vegetables and Fruits Processing Technology | -         | <b>5</b>    | <b>8</b>     | <b>8</b>            | -               | <b>8</b>        | -               | -            | -        |
| 67 | 120072 | Technology of soft drinks and fruit juices                         | -         | <b>3, 8</b> | <b>8, 17</b> | <b>3, 8, 17</b>     | -               | <b>8</b>        | -               | -            | -        |
| 68 | 120073 | Food Additives   | -         | -           | -            | <b>8, 16</b>        | -               | -               | -               | -            | -        |
| 69 | 120074 | Food Safety Laws   | -         | -           | -            | <b>3, 8, 12, 17</b> | -               | -               | -               | <b>8, 17</b> | -        |
| 70 | 120076 | Nutrition and Food Safety  | <b>18</b> | -           | -            | -                   | -               | -               | -               | <b>8</b>     | -        |
| 71 | 120046 | Practical Meat and seafood processing and preservation             | -         | -           | <b>11</b>    | -                   | <b>6, 8, 11</b> | <b>6, 8, 11</b> | <b>6, 8, 11</b> | -            | -        |
| 72 | 120047 | Practical Dairy and Bakery Processing Technology                   | -         | -           | -            | -                   | <b>6, 8, 11</b> | -               | <b>6, 8, 11</b> | -            | -        |
| 73 | 120049 | Practical Tea, Coffee, Vegetables and Fruits Processing Technology | -         | -           | -            | -                   | <b>13</b>       | <b>11</b>       | -               | -            | -        |
| 74 | 120077 | Experiment of soft drinks and fruit juices processing              | -         | -           | <b>11</b>    | -                   | <b>10</b>       | <b>8</b>        | <b>6</b>        | -            | -        |
| 75 | 66666  | Thesis   | -         | -           | <b>7, 8</b>  | -                   | -               | <b>7, 8</b>     | -               | -            | <b>2</b> |

❖ **Assessment Methods**

| <b>No.</b> | <b>Assessment Methods</b> |
|------------|---------------------------|
| <b>1</b>   | Essay                     |
| <b>2</b>   | Project                   |
| <b>3</b>   | Short answer              |
| <b>4</b>   | Case Study                |
| <b>5</b>   | Assignments               |
| <b>6</b>   | Observations              |
| <b>7</b>   | Senior thesis             |
| <b>8</b>   | Presentation              |
| <b>9</b>   | Computer-aided Tests      |
| <b>10</b>  | Performance test          |

| <b>No.</b> | <b>Assessment Methods</b> |
|------------|---------------------------|
| <b>11</b>  | Practicum Report          |
| <b>12</b>  | Peer assessments          |
| <b>13</b>  | Oral Examination          |
| <b>14</b>  | Learning Journals         |
| <b>15</b>  | Field report              |
| <b>16</b>  | Written Examination       |
| <b>17</b>  | Discussion                |
| <b>18</b>  | Multi choices             |
| <b>19</b>  | Checklist                 |

## 7. KNOWLEDGE BLOCKS

| Knowledge Block                                   |   | Total Credits | Total numbers of courses |
|---|---|---------------|--------------------------|
| General Knowledge Block                           | Political Theory  | 11            | 5 courses                |
|   | Language  | 12            | 6 courses                |
|   | Social Sciences   | 2             | 1 courses                |
|   | Mathematics, Computer Science, Natural Sciences, Technology | 13            | 6 courses                |
| Specialized Knowledge Block                       | Specialized Foundation                                      | 57            | 29 courses               |
|   | Specialization  | 45            | 21 courses               |
| Graduation  | Business Internship (if any), Project (if any))             | 10            | 1 course                 |
|   | Thesis or Graduation Project                                |               |                          |
| Minimum Cumulative Credits for the Entire Program |   | <b>150</b>    |                          |

| Course Code             | Course Name                      | Credits       |           |          |            | No. of Periods |
|-------------------------|----------------------------------|---------------|-----------|----------|------------|----------------|
|                         |                                  | Total credits | Theory    | Practice | Assignment |                |
|                         | Defense Education                | 0             | 0         | 0        | 0          | 165            |
| 102002                  | Physical Education 1             | 0             | 0         | 0        | 0          | 30             |
| 102008                  | General physics                  | 3             | 3         | 0        | 0          | 45             |
| 102025                  | Advanced mathematics 1           | 2             | 1         | 0        | 1          | 45             |
| 102055                  | English 1                        | 2             | 2         | 0        | 0          | 30             |
| 120054                  | General Chemistry                | 3             | 3         | 0        | 0          | 45             |
| 120079                  | Field trip                       | 1             | 0         | 1        | 0          | 45             |
| 117043                  | Basic marketing                  | 2             | 2         | 0        | 0          | 30             |
| 117010                  | Labs Technology Skills           | 1             | 0         | 1        | 0          | 45             |
| 117001                  | Experiments In General Chemistry | 1             | 0         | 1        | 0          | 45             |
| <b>Total Semester 1</b> |                                  | <b>15</b>     | <b>11</b> | <b>3</b> | <b>1</b>   | <b>330</b>     |
| 102003                  | Physical Education 2             | 0             | 0         | 0        | 0          | 30             |
| 102011                  | Experiments in general physics   | 1             | 0         | 1        | 0          | 45             |
| 102014                  | Office Information               | 3             | 2         | 1        | 0          | 75             |
| 102062                  | Advanced mathematics 2           | 2             | 1         | 0        | 1          | 45             |
| 102034                  | Probability Statistics           | 2             | 1         | 0        | 1          | 45             |

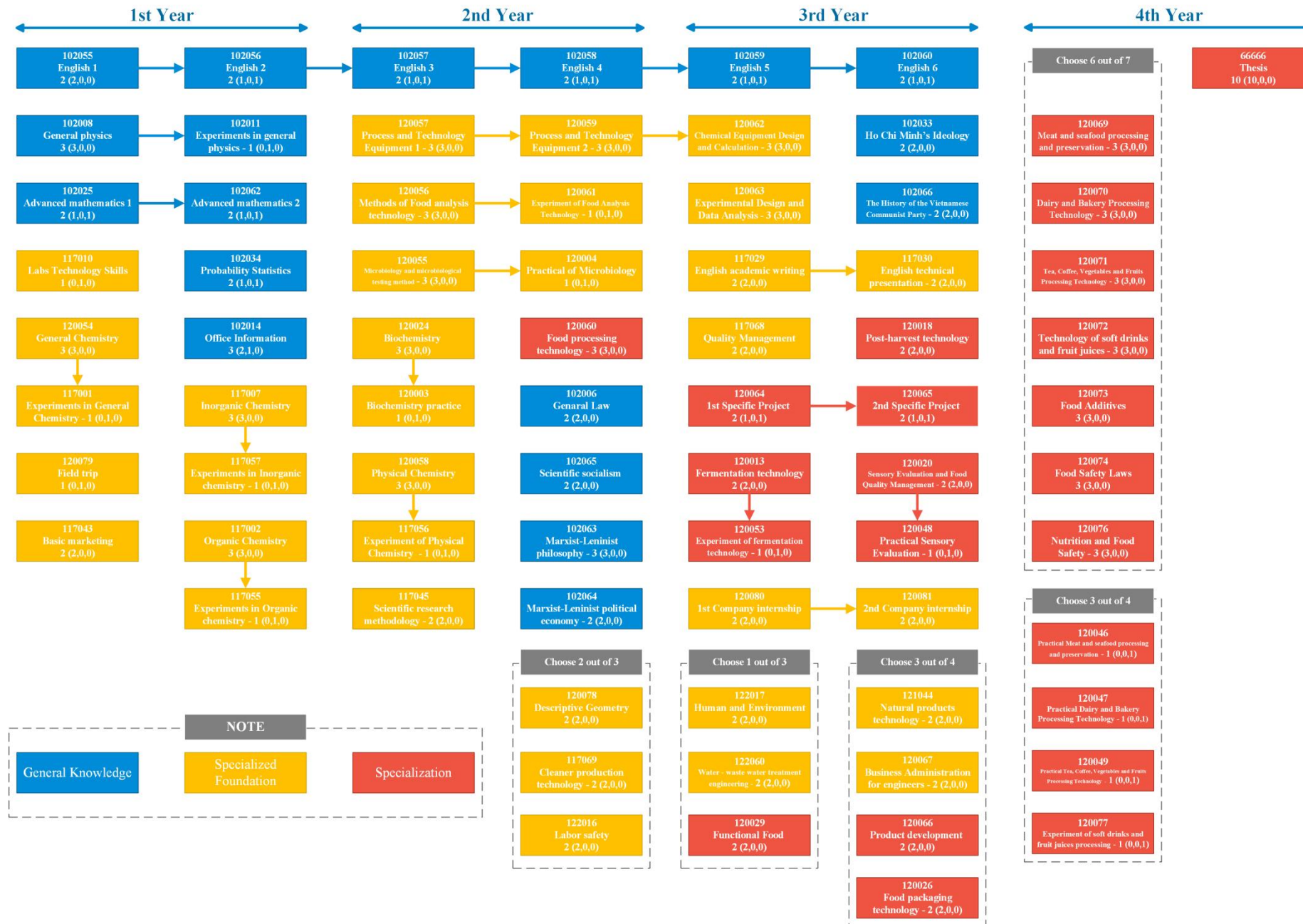
|  |   |           |           |          |          |            |
|--|---|-----------|-----------|----------|----------|------------|
| 102056                                       | English 2                                       | 2         | 1         | 0        | 1        | 45         |
| 117007                                       | Inorganic Chemistry                             | 3         | 3         | 0        | 0        | 45         |
| 117002                                       | Organic Chemistry                               | 3         | 3         | 0        | 0        | 45         |
| 117057                                       | Experiments in Inorganic chemistry              | 1         | 0         | 1        | 0        | 45         |
| 117055                                       | Experiments in Organic chemistry                | 1         | 0         | 1        | 0        | 45         |
| <b>Total Semester 2</b>                      |   | <b>18</b> | <b>11</b> | <b>4</b> | <b>3</b> | <b>435</b> |
| 102004                                       | Physical Education 3                            | 0         | 0         | 0        | 0        | 30         |
| 102057                                       | English 3                                       | 2         | 1         | 0        | 1        | 45         |
| 120055                                       | Microbiology and microbiological testing method | 3         | 3         | 0        | 0        | 45         |
| 120056                                       | Methods of Food analysis technology             | 3         | 3         | 0        | 0        | 45         |
| 120057                                       | Process and Technology Equipment I              | 3         | 3         | 0        | 0        | 45         |
| 120058                                       | Physical Chemistry                              | 3         | 3         | 0        | 0        | 45         |
| 120024                                       | Biochemistry                                    | 3         | 3         | 0        | 0        | 45         |
| 117045                                       | Scientific research methodology                 | 2         | 2         | 0        | 0        | 30         |
| 117056                                       | Experiment of Physical Chemistry                | 1         | 0         | 1        | 0        | 45         |
| 120003                                       | Biochemistry practice                           | 1         | 0         | 1        | 0        | 45         |
| <b>Total Semester 3</b>                      |   | <b>21</b> | <b>18</b> | <b>2</b> | <b>1</b> | <b>390</b> |
| 102063                                       | Marxist-Leninist philosophy                     | 3         | 3         | 0        | 0        | 45         |
| 102064                                       | Marxist-Leninist political economy              | 2         | 2         | 0        | 0        | 30         |
| 102065                                       | Scientific socialism                            | 2         | 2         | 0        | 0        | 30         |
| 102006                                       | General Law                                     | 2         | 2         | 0        | 0        | 30         |
| 102058                                       | English 4                                       | 2         | 1         | 0        | 1        | 45         |
| 120059                                       | Process and Technology Equipment II             | 3         | 3         | 0        | 0        | 45         |
| 120060                                       | Food processing technology                      | 3         | 3         | 0        | 0        | 45         |
| 120004                                       | Practical Of Microbiology                       | 1         | 0         | 1        | 0        | 45         |
| 120061                                       | Experiment of Food Analysis Technology          | 1         | 0         | 1        | 0        | 45         |
| <b>Elective subjects (choose 2 out of 3)</b> |   |           |           |          |          |            |
| 120078                                       | Descriptive Geometry                            | 2         | 2         | 0        | 0        | 30         |
| 122016                                       | Labor safety                                    | 2         | 2         | 0        | 0        | 30         |

|  |  |           |           |          |          |            |
|--|--|-----------|-----------|----------|----------|------------|
| 117069                                       | Cleaner production technology                  | 2         | 2         | 0        | 0        | 30         |
| <b>Total Semester 4</b>                      |  | <b>23</b> | <b>20</b> | <b>2</b> | <b>1</b> | <b>420</b> |
| 102059                                       | English 5                                      | 2         | 1         | 0        | 1        | 45         |
| 120062                                       | Chemical Equipment Design and Calculation      | 3         | 3         | 0        | 0        | 45         |
| 117029                                       | English academic writing                       | 2         | 2         | 0        | 0        | 30         |
| 117068                                       | Quality Management                             | 2         | 2         | 0        | 0        | 30         |
| 120013                                       | Fermentation technology                        | 2         | 2         | 0        | 0        | 30         |
| 120080                                       | 1st company internship                         | 1         | 0         | 1        | 0        | 45         |
| 120063                                       | Experimental Design and Data Analysis          | 3         | 3         | 0        | 0        | 45         |
| 120053                                       | Experiment of fermentation technology          | 1         | 0         | 1        | 0        | 45         |
| 120064                                       | 1st Specific Project                           | 2         | 1         | 0        | 1        | 45         |
| <b>Elective subjects (choose 1 out of 3)</b> |  |           |           |          |          |            |
| 120029                                       | Functional Food                                | 2         | 2         | 0        | 0        | 30         |
| 122017                                       | Human and Environment                          | 2         | 2         | 0        | 0        | 30         |
| 122060                                       | Water - waste water treatment engineering      | 2         | 2         | 0        | 0        | 30         |
| <b>Total Semester 5</b>                      |  | <b>20</b> | <b>16</b> | <b>2</b> | <b>2</b> | <b>390</b> |
| 102066                                       | The History of the Vietnamese Communist Party  | 2         | 2         | 0        | 0        | 30         |
| 102033                                       | Ho Chi Minh's ideology                         | 2         | 2         | 0        | 0        | 30         |
| 102060                                       | English 6                                      | 2         | 1         | 0        | 1        | 45         |
| 117030                                       | English technical presentation                 | 2         | 2         | 0        | 0        | 30         |
| 120081                                       | 2nd company internship                         | 1         | 0         | 1        | 0        | 45         |
| 120018                                       | Post-harvest technology                        | 2         | 2         | 0        | 0        | 30         |
| 120020                                       | Sensory Evaluation and Food Quality Management | 2         | 2         | 0        | 0        | 30         |
| 120065                                       | 2nd Specific Project                           | 2         | 1         | 0        | 1        | 45         |
| 120048                                       | Practical Sensory Evaluation                   | 1         | 0         | 0        | 1        | 30         |
| <b>Elective subjects (choose 3 out of 4)</b> |  |           |           |          |          |            |
| 121044                                       | Natural products technology                    | 2         | 2         | 0        | 0        | 30         |
| 120066                                       | Product development                            | 2         | 2         | 0        | 0        | 30         |
| 120026                                       | Food packaging technology                      | 2         | 2         | 0        | 0        | 30         |



|  |  |            |            |           |           |             |
|--|--|------------|------------|-----------|-----------|-------------|
| 120067   | Business Administration for engineers                              | 2          | 2          | 0         | 0         | 30          |
| <b>Total Semester 6</b>                          |  | <b>22</b>  | <b>18</b>  | <b>1</b>  | <b>3</b>  | <b>405</b>  |
| <b>Elective subjects 7.1 (choose 6 out of 7)</b> |  |            |            |           |           |             |
| 120069   | Meat and seafood processing and preservation                       | 3          | 3          | 0         | 0         | 45          |
| 120070   | Dairy and Bakery Processing Technology                             | 3          | 3          | 0         | 0         | 45          |
| 120071   | Tea, Coffee, Vegetables and Fruits Processing Technology           | 3          | 3          | 0         | 0         | 45          |
| 120072   | Technology of soft drinks and fruit juices                         | 3          | 3          | 0         | 0         | 45          |
| 120073   | Food Additives   | 3          | 3          | 0         | 0         | 45          |
| 120074   | Food Safety Laws   | 3          | 3          | 0         | 0         | 45          |
| 120076   | Nutrition and Food Safety  | 3          | 3          | 0         | 0         | 45          |
| <b>Elective subjects 7.2 (choose 3 out of 4)</b> |  |            |            |           |           |             |
| 120046   | Practical Meat and seafood processing and preservation             | 1          | 0          | 0         | 1         | 30          |
| 120047   | Practical Dairy and Bakery Processing Technology                   | 1          | 0          | 0         | 1         | 30          |
| 120049   | Practical Tea, Coffee, Vegetables and Fruits Processing Technology | 1          | 0          | 0         | 1         | 30          |
| 120077   | Experiment of soft drinks and fruit juices processing              | 1          | 0          | 0         | 1         | 30          |
| <b>Total Semester 7</b>                          |  | <b>21</b>  | <b>18</b>  | <b>0</b>  | <b>3</b>  | <b>360</b>  |
| 66666  | Thesis   | 10         | 10         | 0         | 0         | 150         |
| <b>Total Semester 8</b>                          |  | <b>10</b>  | <b>10</b>  | <b>0</b>  | <b>0</b>  | <b>150</b>  |
| <b>Total</b>                                     |  | <b>150</b> | <b>122</b> | <b>14</b> | <b>14</b> | <b>2880</b> |

## 8. ROADMAP OF CURRICULUM



## 9. GRADUATION REQUIREMENTS

Students must meet the criteria according to the regulations on regular university and college training for the cohort 2023-2027, issued under Decision No. 1013/QĐ-ĐHLH dated October 09, 2023 by the Rector of Lac Hong University.

| <b>Graduation Requirements</b>   |   |  |  |  |   |
|--|---|--|--|--|---|
| <b>Informatics Certificates</b>  | <b>Foreign Language Certificates</b>  | <b>Defense Education Certificates</b>  | <b>Physical Education Certificates</b>                       | <b>Soft Skills Certificates</b>  | <b>Other Certificates</b>   |
| Meet one of the following requirements:<br>- Certificate of information technology application (Basic level; awarded by Lac Hong University).<br>- Types of degrees, certificates, and equivalent certifications | Meet one of the following requirements:<br>- Certificate of English language (level 3) according to the 6-level Foreign Language Competency Framework for Vietnam issued by Lac Hong University or units recognized by the Ministry of Education and Training as qualified to organize exams and issue English certificates according to 6-level foreign language | Certificate of National Defense Education issued by Lac Hong University or training facilities authorized by the Ministry of Education and Training to train the subject of National Defense and Security. | Certificate of completion of the Physical Education program. | Certificate of completion of the Soft Skills programme (4 skills) issued by Lac Hong University. | - Completed all courses, credits, and other content according to the requirements and meeting the learning outcomes of the educational programme.<br>- Cumulative Grade Point Average (GPA) of the entire course reaches average or higher.<br>- Upon the time of graduation, students are not being prosecuted for criminal liability or being disciplined at the level of |

|  |  |  |  |  |   |
|--|--|--|--|--|---|
|  | competency framework for Viet Nam<br>- Types of degrees, certificates, and equivalent certifications |  |  |  | suspension.<br>- Fulfill the obligations regarding tuition, fees... required by the University.<br>-Fulfill obligations related to learning materials at the library. |
| * Note: The above diplomas, certificates, certifications, and transcripts must be valid at the time of eligibility for graduation recognition. |  |  |  |  |   |

## 10. BRIEF OUTLINE OF ALL COURSES

### 10.1. General Education

#### 10.1.1. Physical Education 1

Credit: 1

Students can choose 1 of 3 subjects: Volleyball, Soccer, and Basketball to study the physical education program 1. After completing the subject, students are equipped with basic knowledge corresponding to the chosen subject. Implement some techniques and apply those techniques in training and competition. Understand the basic rules of competition for the chosen subject.

#### 10.1.2. Physical Education 2

Credit: 1

Students continue to study the chosen sport in Physical Education 1

#### 10.1.3. Physical Education 3

Credit: 1

Students continue to study the chosen sport in Physical Education 1

#### 10.1.4. English 1

Credit: 2

The course introduces students to how to recognize and pronounce correctly according to the international phonetic system, how to stress words and common types of intonation in spoken language. In addition, the course also introduces students to English learning methods, resources, and online English learning programs, as well as how to use dictionaries.

#### 10.1.5. English 2

Credit: 2

The English 2 provides vocabulary and grammatical structures that are necessary for everyday communication at the elementary level

❖ **Knowledge:**

Knowledge of vocabulary and communicative sentence patterns about familiar topics such as people, objects, time, places, daily activities, hobbies, travel, food and drink, life stories

**Skills:**

- Practice exercises on vocabulary, grammar, reading comprehension, and listening comprehension on the above topics
- Practice communicating in English at the elementary level in situations related to the above topics

❖ **Attitude:**

Follow discipline and be aware of your responsibilities throughout the course. Actively participate in class learning activities and complete homework

### **10.1.6. English 3**

Credit: 2

English 3 helps students consolidate the English communication knowledge that they have learned in English 1 and English 2, and expand their communication knowledge at the elementary level. The course provides knowledge of vocabulary, grammar, and pronunciation on each familiar and practical topic to maximize English communication ability.

Simultaneously, the course can help students apply listening, speaking, and reading skills through topics into real situations and effectively practice what they have learned to express feelings, opinions, and opinions in English in communication suitable for each specific situation. In addition, the course helps students practice a sense of discipline, a sense of responsibility for themselves and and effectively maintain self-learning ability and lifelong learning ability through learning resources and tools.

### **10.1.7. English 4**

English 4 equips students with basic English knowledge, including:

❖ **Knowledge:**

- Apply vocabulary at pre-intermediate level to express yourself and desires on most topics related to daily life, such as entertainment and sports, events, work and rest, holidays, appearance, travel, and success...

- Demonstrate the ability to describe incidental situations, explain the main points of a problem with reasonable accuracy, and express opinions on familiar topics at pre-intermediate level.

- Present ideas in English with clear and understandable pronunciation, communicating effectively at pre-intermediate level

❖ **Skills:**

• **Listening Comprehension Skill:**

- Understand simple conversations about daily personal life at the pre-intermediate level).

- Understand conversations on common topics (entertainment and sports, events, work and rest, holidays, appearance, travel, and success...) at the pre-intermediate level.

- Understand user guide manuals, notices, telephone messages at the pre-intermediate level

- Identify the main ideas and details of slow-reading news reports on familiar everyday topics (entertainment and sports, events, work and rest, holidays, appearance, travel, and success...) at pre-intermediate level.

• **Speaking Skill:**

- Describe personal topics, such as: hobbies, leisure activities at pre-intermediate level;

- Tell details about personal experiences, events, movies and express your feelings at pre-intermediate level;

- Give a simple description of dreams, hopes, and desires (pre-Intermediate level)

- Briefly present a familiar topic (entertainment and sports, events, work and rest, holidays, appearance, travel, and success..) and answer relevant questions clearly (pre-intermediate level).

- Discuss common topics such as entertainment and sports, events, work and rest, holidays, appearance, travel, and success..entertainment and sports, events, work and rest, holidays, appearance, travel, and success., and use techniques to ask again when you don't understand (Pre-Intermediate level).

- Communicate confidently in everyday situations at university, workplace, amusement park..., with appropriate language (pre-intermediate level).

- Use appropriate language to respond to emotions such as surprise, happiness, sadness, concern, anxiety... (Pre-intermediate level)

• **Reading Comprehension Skill:**

- Understand information in everyday texts such as letters, advertisements, leaflets, and other documents (Pre-Intermediate level).

- Broadly identify the argument of a text (Pre-Intermediate level).

- Understand the content and emotions of informal correspondence (Pre-Intermediate level).

- Search and collect necessary information from texts and synthesize information from texts to complete an assigned assignment (Pre-Intermediate level).

- Guess the meaning of words based on context (Pre-Intermediate level).

❖ **Attitude**

- Be more aware of the importance of practicing and using foreign languages in study, work and life. Form and develop the spirit of independent learning, cooperation, mutual support through interactive activities, group study... have good behavior and communication with everyone.

- Adhere to discipline, self-discipline, and responsibility in learning both inside and outside the class. Train and develop self-study ability, regular training and lifelong learning.

- Expand their understanding, feel, and learn good things about the languages and cultures

of English-speaking countries and the world, while enhancing the spirit of pride, respect, and cultural preservation, Vietnamese.

#### **10.1.8. English 5**

Credit: 2

English 5 equips students with basic knowledge of familiar areas such as Where People Live, Old and New, Care, Best Things, New Products, Right People, Money..., so that students can carry out written, visual and presentation communication to present the work done

#### **10.1.9. English 6**

Credit: 2

English 6 helps students consolidate the English communication knowledge they learned in English 1, English 2, English 3, English 4 and English 5, and expand their communication knowledge at the intermediate level. Thereby, learners have the ability to practice conversations, vocabulary building exercises, and participate in activities to maximize their English listening and speaking time.

The course can help students confidently use English to express views, opinions and share personal experiences through applying knowledge of vocabulary, grammar, and language functions of various topics. Topics such as lifestyle, childhood memories, travel, life events, personal characteristics, careers, narrate stories and help students actively learn throughout their lives.

The course trains students to have a sense of discipline and responsibility for themselves and the teaching process of the lecturer, and a willingness to participate in solving presented communication situations.

#### **10.1.10. Advanced Mathematics 1**

Credit: 2

Advanced Mathematics 1 provides students with basic knowledge about limits, continuity, integration of one variable functions, series, and some of their applications.

#### **10.1.11. Advanced Mathematics 2**

Credit: 2

Advanced Mathematics 2 provides students with basic knowledge about matrices, determinants, systems of linear equations, differentiation and integration calculus of multivariable functions, differential equations, and some of their applications.

#### **10.1.12. Probability Statistics**

Credit: 2

Probability Statistics provides students with basic knowledge of probability theory and applied statistics including probability and probability formulas, random quantities and probability distribution, sample theory, parameter estimation, and some statistical applications in practice.

#### **10.1.13. General physics**

Credit: 3

General Physics provides students with basic knowledge of mechanical work, fluids, heat, electric current, and optics. Introduces pre-quantum mechanics and their applications in Food Technology

#### **10.1.14. Experiments in general physics**

Credit: 1

Experiments in general physics (Food science and technology) provide students with knowledge and measuring techniques and recording physical quantities of heat, electric current, optics, and their applications

#### **10.1.15. Office Information**

Credit: 3

Office Information includes 3 parts: Basic computer usage; Office information; Internet usage. At the end of the course, students can use computers and the Microsoft Windows Operating System at a basic level; be able to use office information software for study and work; and use internet access tools to search for documents and exchange information.

#### **10.1.16. General Law**

Credit: 2

General Law equips non-law students with the most basic knowledge about the State and law in general, and the socialist state and law in particular. From there, it helps students have the right awareness and viewpoints about the Party's guidelines and policies and the State's laws. At the same time, equip students with basic knowledge about the Vietnamese legal system and some specific law fields such as Civil law and civil procedure, Labor law, Criminal law and procedure. criminal law, administrative law and administrative proceedings, business law, and anti-corruption law, helping students better understand the law to apply it in real life.

#### **10.1.17. Marxist-Leninist philosophy**

Credit: 3

The course Marxist-Leninist Philosophy for university students of non-political theory majors aims to:

Knowledge: Students can present the basic contents of philosophy, Marxist-Leninist philosophy, and the role of Marxist-Leninist philosophy in social life; The basic contents of dialectical materialism include issues of matter and consciousness; materialist dialectics, cognitive theory of dialectical materialism; The basic contents of historical materialism include the issue of socio-economic form; Class and ethnicity; State and social revolution; Social consciousness; Philosophy of man.

Skill: Apply knowledge of Marxist-Leninist philosophy to study and work.

Attitude: Respect objective rules in the learning and working process

#### **10.1.18. Marxist-Leninist political economy**

Credit: 2

Marxist-Leninist Political Economy includes 6 chapters, aiming to equip learners:



Knowledge: Students can present the basic content of the subject: Commodities, Markets, Market economy laws, surplus value production, competition, monopoly, and political economic issues in Vietnam,...

Skill: Apply learned knowledge about economic phenomena, basic laws of the commodity economy, and the socialist-oriented market economy.

Attitude: Adjust behavior in accordance with the objective laws of the economy

#### **10.1.19. Scientific socialism**

Credit: 2

Scientific Socialism is for university students of non-political theory majors, including 8 chapters, equipping learners with:

Knowledge: Students understand the laws of the emergence of socioeconomic formations, communism, the conditions for the emergence, and the basic content of scientific socialism (the historical mission of the working class, socialism and the transition period to socialism, socialist democracy, and the socialist state, class structure, and class alliances in the transition period to socialism, issues ethnicity, religion, family during the transition period to socialism).

Attitude: Have an optimistic attitude, believe in the Vietnamese Communist Party's leadership, respect and strictly comply with legal regulations in professional practice. Build a sense of responsibility for work, contributing to building the country towards a socialist orientation.

#### **10.1.20. The History of the Vietnamese Communist Party**

Credit: 2

The course History of the Communist Party of Vietnam aims to equip learners with:

Knowledge: Basic and systematic understanding of the founding of the Party; The process of the Party leading the Vietnamese revolution to seize power (1930-1945), the resistance war against the French colonialists and the American imperialists (1945-1954); The process of the Party leading the country in excessive transition to socialism (1974-present).

Skill: Explain issues about the guidelines and policies of the Communist Party of Vietnam during practice.

Attitude: Comply with the Party's guidelines in comprehensive leadership of society.

#### **10.1.21. Ho Chi Minh's ideology**

Credit: 2

**Ho Chi Minh's ideology** aims to equip learners:

Knowledge: Students can present the foundation and basic contents of Ho Chi Minh's ideology, including the ideology of national independence and socialism; the ideology of the Vietnamese Communist Party and the State; the ideology of great unity and international solidarity; and the ideology of culture, morality, and people.

Skill: Choose learning and working methods that are consistent with Ho Chi Minh's ethical standards

Attitude: Comply with ethical standards in professional practice and life.

### **10.2. Professional Education Block**

#### **10.2.1. Labs Technology Skills**

Credit: 1

Labs Technology Skills (food science and technology) provides students with knowledge about labeling and classifying chemicals, preparing solutions, and treating toxic chemicals and solvents. Practice techniques and use equipment and glassware in the chemistry laboratory.

### **10.2.2. General Chemistry**

Credit: 3

General Chemistry equips students with general knowledge of chemistry, including basic concepts and laws of chemistry; atomic structure - periodic laws of chemical elements; a chemical linkage; state of aggregation of substances; solution; electrolyte solution, and electrochemical cell.

### **10.2.3. Experiments in general chemistry**

Credit: 1

Experiments in general chemistry (food science and technology) equip students with knowledge about solution preparation, and techniques for measuring and recording chemical quantities, such as concentration and reaction rate, pH value of solution, specific conductivity, density, and humidity.

### **10.2.4. Organic Chemistry**

Credit: 3

The course provides knowledge about the theoretical basis of organic chemistry (isomerism, effects, and common reactions in organic chemistry) and knowledge about the functional groups of hydrocarbons and their derivatives (structure, nomenclature, preparation methods, physical properties, important chemical properties, and applications).

### **10.2.5. Experiments in Organic Chemistry**

Credit: 1

Experiments in Organic Chemistry help students become familiar with the synthesizing basic organic compounds process based on reactions such as esterification reaction, dehydration reaction, oxidation reaction, sulfonation reaction, saponification reaction..... Through synthetic practice, students will practice the skills of assembling a reaction system and the skill of purifying organic compounds after the reaction.

### **10.2.6. Inorganic Chemistry**

Credit: 3

Inorganic Chemistry consists of 10 chapters providing students with basic knowledge of issues related to the properties of chemical elements in the periodic table, the theoretical basis of chemical bonds in inorganic compounds, physical and chemical properties, preparation methods, and applications of inorganic substances and compounds.

### **10.2.7. Experiments in Inorganic Chemistry**

Credit: 1

Experiments in Inorganic Chemistry include experiments related to the chemical properties of elements and compounds of elements belonging to the main group (group A) and elements

belonging to a subgroup (group B). After completing the course, students practice basic skills and manipulation in the laboratory, observe phenomena, and apply the inorganic theoretical knowledge they have learned to explain phenomena that occur when performing experiments.

#### **10.2.8. Physical Chemistry**

Credit: 3

Physical Chemistry provides theoretical knowledge related to the following physicochemical processes:

- Thermodynamic principles and their applications to investigate the thermal effects of reactions;
- Phase and phase transition processes
- Chemical equilibrium and phase equilibrium in one-component systems;
- Solutions and types of equilibria in solutions.

#### **10.2.9. Experiment of Physical Chemistry**

Credit: 1

This course provides practical content to help students better understand the physicochemical processes occurring in reactions and how to determine the physicochemical parameters of the system (thermal effects, equilibrium constants, heat of reaction) through experimentation. The course also helps improve and practice skills in the laboratory as well as how to write reports, and present and process experimental data.

#### **10.2.10. Biochemistry**

Credit: 3

The course covers topics related to biochemistry in food technology including:

- Introduction to basic biological compounds in food.
- The physicochemical properties of biological compounds are relevant for applications in food technology.
- Metabolic processes in cells, mainly the metabolism of basic compounds in cells, are applied in food preservation and processing.

#### **10.2.11. Biochemistry practice**

Credit: 1

**Biochemistry practice** provides practical skills for qualitative and quantitative biological compounds, including:

- Protein determination;
- Determination of Glucid, determination of reducing sugar and total sugar by Bertrand method;
- Lipid determination;
- Quantification of Vitamin C by chemical method;
- Determination of the activity of some Enzymes.

#### **10.2.12. Scientific research methodology**

Credit: 2

This course provides basic knowledge about science and scientific research, scientific research methods. This course also helps students learn about different types of scientific reports

#### **10.2.13. Methods of Food analysis technology**

Credit: 3

The course equips students with knowledge of analytical methods from which to choose appropriate methods to analyze physicochemical properties, content, and structure of basic ingredients in food.

#### **10.2.14. Experiment of Food Analysis Technology**

Credit: 1

Experiment of Food Analysis Technology helps students understand and apply the knowledge they have learned to evaluate the quality of a food product. From there, it helps students have the ability to apply in production and research practices.

#### **10.2.15. Microbiology and microbiological testing method**

Credit: 3

The course provides food technology students with basic knowledge and expertise about microorganisms such as morphology, physiology, microbial nutrition, and basic techniques in microbiological analysis and testing.

#### **10.2.16. Practical of Microbiology**

Credit: 1

The course helps students review knowledge and apply it practically. Students must master basic and required skills. Students will be able to observe and recognize the shape of microorganisms at microscope magnifications and count microbial cells. Include:

- Preparing the environment
- Techniques for culturing, growing and observing the growth of microorganisms
- Isolation of pure microorganisms
- Observation of bacteria, yeast, and mold
- Observation of Escherichia coli and Coliform determination
- Determination of total aerobic bacteria
- Determination of total yeast – total mold

#### **10.2.17. Descriptive Geometry**

Credit: 2

The course equips students with basic knowledge of technical drawing: projections, representation methods, rules, and regulations of government standards on technical drawings. Provides knowledge, reading comprehension skills as well as how to create technical drawings used in the field of mechanical engineering.

Practice scientific working style, carefulness, and sense of discipline for student

#### **10.2.18. Process and Technology Equipment 1**

Credit: 3

The course consists of 2 parts:

Part 1: Fluid mechanics and bulk materials mechanics

Fluid mechanics and materials mechanics then consist of 2 parts:

The fluid mechanics section deals with issues of fluid mechanics, fluid flow, and equipment used in food technology such as sedimentation and filtration. The bulk materials section describes the processes of transporting bulk materials, principles of size reduction, and classification of bulk materials.

### **Part 2: Heat Transfer process and equipment**

Provides learners with basic knowledge about the heat transfer process: heat conduction, heat convection, heat radiation, heat exchange (heating, cooling, condensation), and heat transfer equipment to help students apply knowledge to calculate and select heat exchange equipment to fit processes in food technology.

### **10.2.19. Process and Technology Equipment 2**

Credit: 3

The course consists of 2 parts:

#### **Part 1: Mass transfer process and equipment**

Mass Transfer equips students with basic knowledge about the structure and operating principles, advantages and disadvantages, and applications of mass transfer equipment: absorption, distillation, drying... to separate substances Food Technology Products. Apply learned theory to calculate basic parameters of mass transfer processes and analyze mass transfer problems in the field of food technology.

#### **Part 2: Chemical Reaction Engineering**

Chemical Reaction Engineering provides students with knowledge and skills in calculating reactors. On that basis, students can preliminarily evaluate the effectiveness of a reaction process, equipment performance, and other factors to optimize production processes.

### **10.2.20. Chemical Equipment Design and Calculation**

Credit: 3

This course provides knowledge about the design of chemical and food equipment including:

- Choosing suitable materials;;
- Dependent relationship between the dimensions of equipment parts and the properties of materials and processing and manufacturing methods;
- Calculating the basic parameters of the device;
- Calculating the main parts and accessories of the equipment;
- Methods for checking the durability of equipment parts and design methods.

### **10.2.21. Quality Management**

Credit: 2

The course helps students gain basic knowledge about quality management, including:

- Basic concepts of quality and quality management
- Quality management tools;
- Quality management methods and quality management standards.

### **10.2.22. English academic writing**

Credit: 2

The course provides students with basic reading comprehension skills and methods for writing specialized scientific articles in English.

#### **10.2.23. English technical presentation**

Credit: 2

The course helps students become familiar with presenting the content of a scientific report using a poster

#### **10.2.24. Food processing technology**

Credit: 3

Food processing technology teaches students about production processes and raw material processing directions in the food industry. This course also helps students apply knowledge about the technological properties of each type of raw material and product to build appropriate processing technology processes.

#### **10.2.25. Fermentation Technology**

Credit: 2

Fermentation technology provides food technology students with knowledge about the technological process of producing food products using fermentation methods, including:

- Technology for producing fermented foods from cereals;
- Technology for producing fermented foods from fruits and vegetables;
- Technology for producing fermented products from fish meat;
- Technology for producing fermented milk products.

#### **10.2.26. Experiment of Fermentation Technology**

Credit: 1

The course provides students with knowledge and the ability to practice several technologies for producing fermented products. Thereby, students understand the production process as well as basic operations in researching and operating fermented food production, including:

- Technology for producing fermented foods from cereals;
- Technology for producing fermented foods from fruits and vegetables;
- Technology for producing fermented products from fish meat;
- Technology for producing fermented milk products.

#### **10.2.27. Experimental Design and Data Analysis**

Credit: 3

The course aims to equip students with basic knowledge of univariate analysis, multivariate analysis, variance analysis, correlation analysis, and regression equations. Students are introduced to the sequence of steps when conducting experiments and research. After the course, students have good skills in using statistical processing software to process and analyze experimental results.

#### **10.2.28. Functional Food**

Credit: 2

The course introduces concepts of functional foods; classification and disease prevention value of functional foods; principles and methods of developing functional foods.

#### **10.2.29. 1st Specific Project**

Credit: 2

Instruct students in the knowledge and skills necessary to conduct a survey or research in Food Technology. Then request students to choose a topic and conduct surveys related to the topic in the laboratory.

#### **10.2.30. 2nd Specific Project**

Credit: 2

Instruct students in the knowledge and skills necessary to conduct a survey or research in Food Technology. Then request students to choose a topic and conduct surveys related to the topic in the laboratory.

#### **10.2.31. Post-harvest technology**

Credit: 2

Post-harvest technology provides students with an understanding of physiological and biochemical changes in post-harvest agricultural products; Physiological disorders, damage caused by microorganisms, pathogens, and other factors lead to the deterioration of agricultural product quality; At the same time, it helps students master knowledge of preservation methods and processing technology of agricultural products.

#### **10.2.32. Sensory Evaluation and Food Quality Management**

Credit: 2

Sensory Evaluation and Food Quality Management aims to equip students with basic knowledge and skills in sensory evaluation of food, as well as the interaction mechanism of odor and taste compounds on sensory cells on senses such as taste and sense of smell. The course helps students approach sensory evaluation methods and corresponding data processing commonly used in quality assessment and product development research such as discrimination, description, and hedonic tests.

#### **10.2.33. Practical Sensory Evaluation**

Credit: 1

The course aims to equip students with basic knowledge and skills in sensory evaluation of food, as well as the interaction mechanism of odor and taste compounds on sensory cells on senses such as taste and sense of smell. At the same time, it helps learners access sensory evaluation methods and corresponding data processing commonly used in quality assessment and product development research such as discrimination, description, and hedonic tests.

#### **10.2.34. Product Development**

Credit: 2

The course provides basic knowledge about product development, stages of the product development process, how to plan and implement product development goals, and methods to create new products and tasks needed to commercialize the product

#### **10.2.35. Food packaging technology**

Credit: 2

Môn học nhằm trang bị cho sinh viên những kiến thức về: định nghĩa, phân loại, chức năng của bao bì thực phẩm là đảm bảo và xác thực chất lượng của nguyên liệu hoặc sản phẩm thực phẩm và những yếu tố tạo nên chức năng bao bì.

The course aims to equip students with knowledge about the definition, classification, and function of food packaging to ensure and authenticate the quality of raw materials or food products and the factors that create the function of packaging.

- The type of material and material properties meet the requirements for preserving all types of raw materials and food products.
- Structure of material layers and packaging shape.
- Methods and equipment for filling and sealing packaging.
- Regulations on labeling content.
- Code signing in international trade and management.
- Damages and causes.
- Hygiene and safety of food packaging.

#### **10.2.36. Meat and seafood processing and preservation**

Credit: 3

Meat and seafood processing and preservation equip students with basic knowledge and skills to understand ingredients used in food and methods to preserve and process meat and seafood. This module will help students realize the role and importance of meat and seafood in nutrition, food processing, and industrial production.

#### **10.2.37. Dairy and Bakery Processing Technology**

Credit: 3

The course aims to equip students with knowledge about milk ingredients and ingredients for cake and candy production. At the same time, providing knowledge about the technological process of milk processing, fermented milk products, and the technological process of cake and candy production.

#### **10.2.38. Tea, Coffee, Vegetables, and Fruits Processing Technology**

Credit: 3

Tea, coffee, and vegetable processing technology is one of the important and in-depth subjects about tea, coffee, vegetable, fruit, and tuber processing technologies... This course provides students with knowledge of vegetable, fruit, tea, and coffee processing technology and factors affecting the processing process of fruit and vegetable products, tea, and coffee.

#### **10.2.39. Producing Soft drink technology**

Credit: 3

Beverage production technology provides students with knowledge about the history of the formation and development of beverages; some basic processes and advanced techniques in wine, beer, and beverage production technology; technological process for producing some types of mixed beverages, fruit juices, and alcoholic beverages.

#### **10.2.40. Food Additives**



Tên tiếng Anh: Food Additives

Credit: 3

It is a compulsory subject in the specialized knowledge block. The course provides students with basic knowledge about the classification, structure, features, and applications of additives in food processing technology. Through the course, students are evaluated at the end of the semester by an essay exam with the identification and allowable dosage of additives in food products.

#### **10.2.41. Food Safety Laws**

Credit: 3

Food Safety Laws equips students with knowledge about quality control and food safety; Knowledge of Laws, Decrees, and Circulars in food production and processing.

#### **10.2.42. Nutrition and Food Safety**

Credit: 3

The course equips students with basic knowledge about the role of nutrients in human health. This course also equips students with knowledge about toxins found in food as well as measures to prevent food poisoning.

#### **10.2.43. Practical Meat and seafood processing and preservation**

Credit: 1

The subject aims to help students practice skills and apply theory to practice in the field of meat and seafood processing and preservation.

#### **10.2.44. Practical Dairy and Bakery Processing Technology**

Credit: 1

The course aims to equip students with basic knowledge about raw materials, products, main changes, and main equipment in the milk processing and confectionery production process.

#### **10.2.45. Practical Tea, Coffee, Vegetables and Fruits Processing Technology**

Credit: 1

Practical Tea, Coffee, Vegetables, and Fruits Processing Technology provides students with basic knowledge about the characteristics of ingredients such as tea, coffee, and popular tropical fruits and vegetables. The course also helps students learn, grasp, and implement the processes of processing products from tea, coffee, vegetables, and fruits such as green tea, yellow tea, red tea, black tea, roasted and ground coffee, jam, juicy fruit, and dried vegetables, and approach quality criteria for some products from tea, coffee, fruits, and vegetables.

#### **10.2.46. Experiment of soft drinks and fruit juices processing**

Credit: 1

The course covers the survey of the main stages in the production of carbonated and non-carbonated beverages; the preparation process; Filling the product and finally determining the causes of damage and loss of beverage quality.

#### **10.2.47. Field trip**

Credit: 1

Field trip is a course that provides students with knowledge and skills about actual production activities at the enterprise's factory. The course helps students become familiar with the reality of production labor outside the enterprise.

#### **10.2.48. 1st company internship**

Credit: 1

1st company internship is an important course for food technology students. During the internship at the enterprise, students learn about issues related to processes and equipment such as structure, operating principles, technical parameters in equipment operation, and influencing factors to the equipments.

#### **10.2.49. 2nd company internship**

Credit: 1

2nd company internship is an important course for food technology students. During the internship process at the enterprise, students are trained and practice skills, professional working attitudes, and develop relationships to prepare for future careers after graduation.

#### **10.2.50. Basic Marketing**

Credit: 2

The course provides students with basic knowledge about Marketing and its application to business practice, including basic concepts related to Marketing, and environmental factors affecting customer shopping behavior. , product strategies, pricing, distribution, and promotion in the business of the enterprise.

#### **10.2.51. Business Administration for engineers**

Credit: 2

This course equips students with basic knowledge of business administration for engineers. At the end of the course, students will understand the concepts and methods of business management in an enterprise; Analyze the decision-making process of managers and activities in Marketing management; understand the organizational structure of human resource management; Evaluate the results of production and business activities of the enterprise; thereby improving business management solutions stemming from cultural differences in businesses

#### **10.2.52. Labor Safety**

Credit: 2

The course aims to equip students with basic knowledge about labor safety and proactively propose measures to prevent accidents. Accidents can be prevented, so an effective method to prevent occupational accidents is training and education to avoid unsafe behaviors.

#### **10.2.53. Cleaner production technology**

Credit: 2

The course includes the main contents: the reasonableness and urgency of implementing Cleaner Production by companies and enterprises. Method for evaluating benefits obtained from a Cleaner Production project, environmental audit method, product life cycle assessment

method (Life-Cycle Assessment - LCA), and clean development mechanism (Clean Development Mechanism - CDM)

#### **10.2.54. Human and Environment**

Credit: 2

Human and Environment provides knowledge about human development associated with the interaction of humans and the environment. This course also provides basic measures to protect the environment, aiming to ensure the living environment and food supply are not contaminated, contributing to protecting human health.

#### **10.2.55. Water - waste water treatment engineering**

Credit: 2

Water-waste water treatment engineering introduces wastewater sources, composition, properties, and criteria for evaluating wastewater quality and wastewater treatment works. The course provides knowledge about types of water sources, surface water and groundwater treatment technology, water quality, and water supply standards for life and industry.

#### **10.2.56. Natural products technology**

Credit: 2

The course learns about types of natural compounds and learns about the research process of natural compounds. The course content focuses on introducing students to basic knowledge about natural compounds such as classification, structure, properties, extraction and isolation methods, biological and pharmacological effects as well as the application of natural compounds.

### **10.3. Graduation knowledge block**

#### **10.3.1. Thesis**

Credit: 10

The thesis helps students:

- Consolidate and improve learned knowledge. Initially apply specialized knowledge to solve practical problems in the production process and social life requirements.
- Practice skills, and build the style and working methods of a Food Technology engineer.
- Practice analysis, synthesis, proposal and problem-solving skills, and soft skills.